

# NANO TITANIUM DIOXIDE AS AN EFFICIENT COMPLEXING AGENT FOR THE SYNTHESIS OF CURCUMIN

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## ABSTRACT

Curcumin is a natural polyphenol known to exhibit multiple therapeutic effects. Methods for the synthesis of curcumin employ complexing of acetylacetone with boron compounds, which protects the active methylene group. As the reactions are not optimal with boron-based complexes, alternative complexing agents for greater efficiency were explored. Amongst these, titanium dioxide and its nanoparticles offered superior complexing activity. This complex was prepared *in situ* and was characterized to be titanyl acetylacetonate. The reaction conditions were optimized with different solvents, catalysts, water scavenging agents and temperatures using the OVAT (one variable at a time) approach. We then utilized the statistical design of experiments (DOE) approach to optimize critical parameters that influence the yield and purity of curcumin. The optimized reaction conditions yielded curcumin exceeding 90 %, with a reaction time of 8 h, suggesting that nano TiO<sub>2</sub> functions very effectively as a complexing agent.